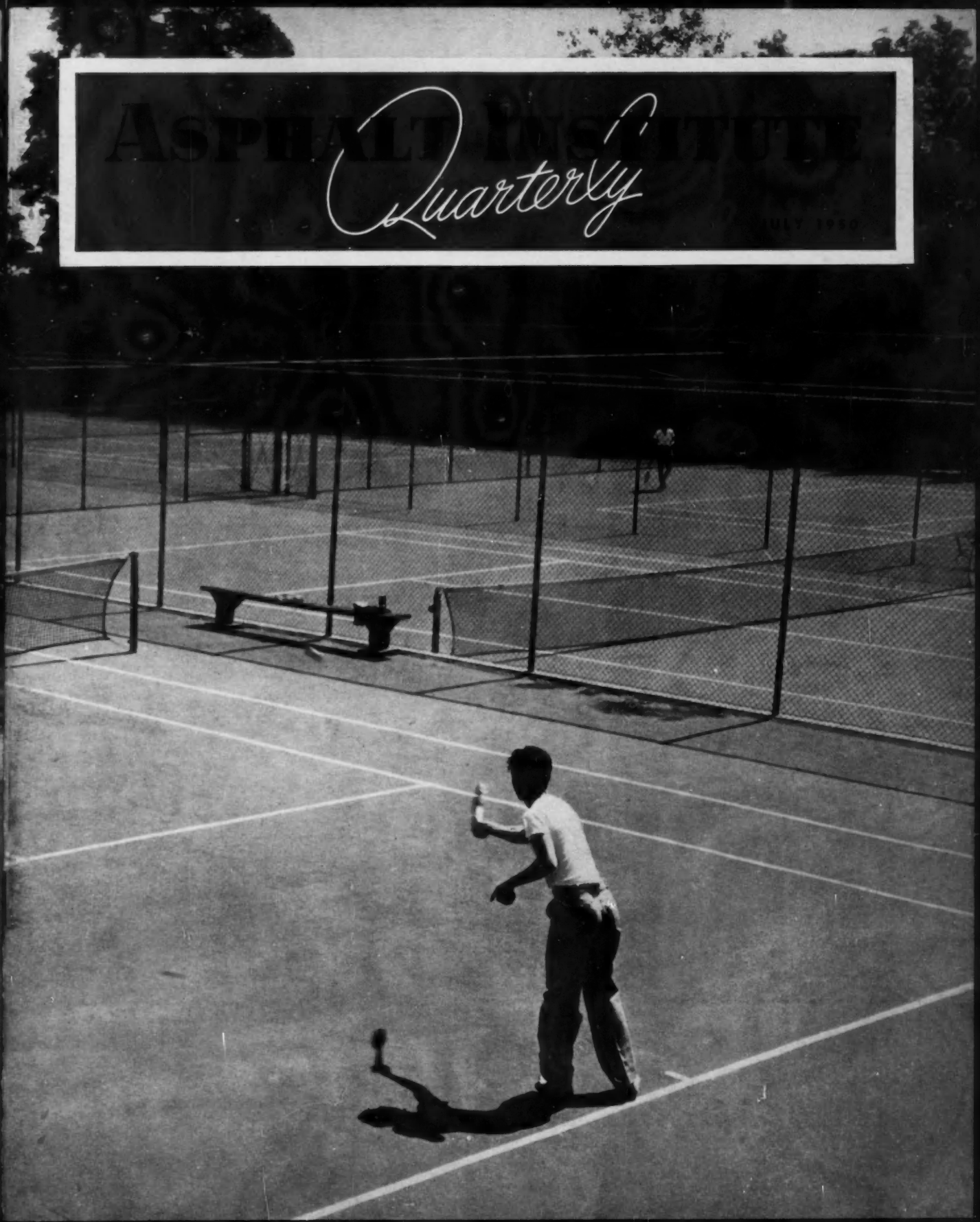
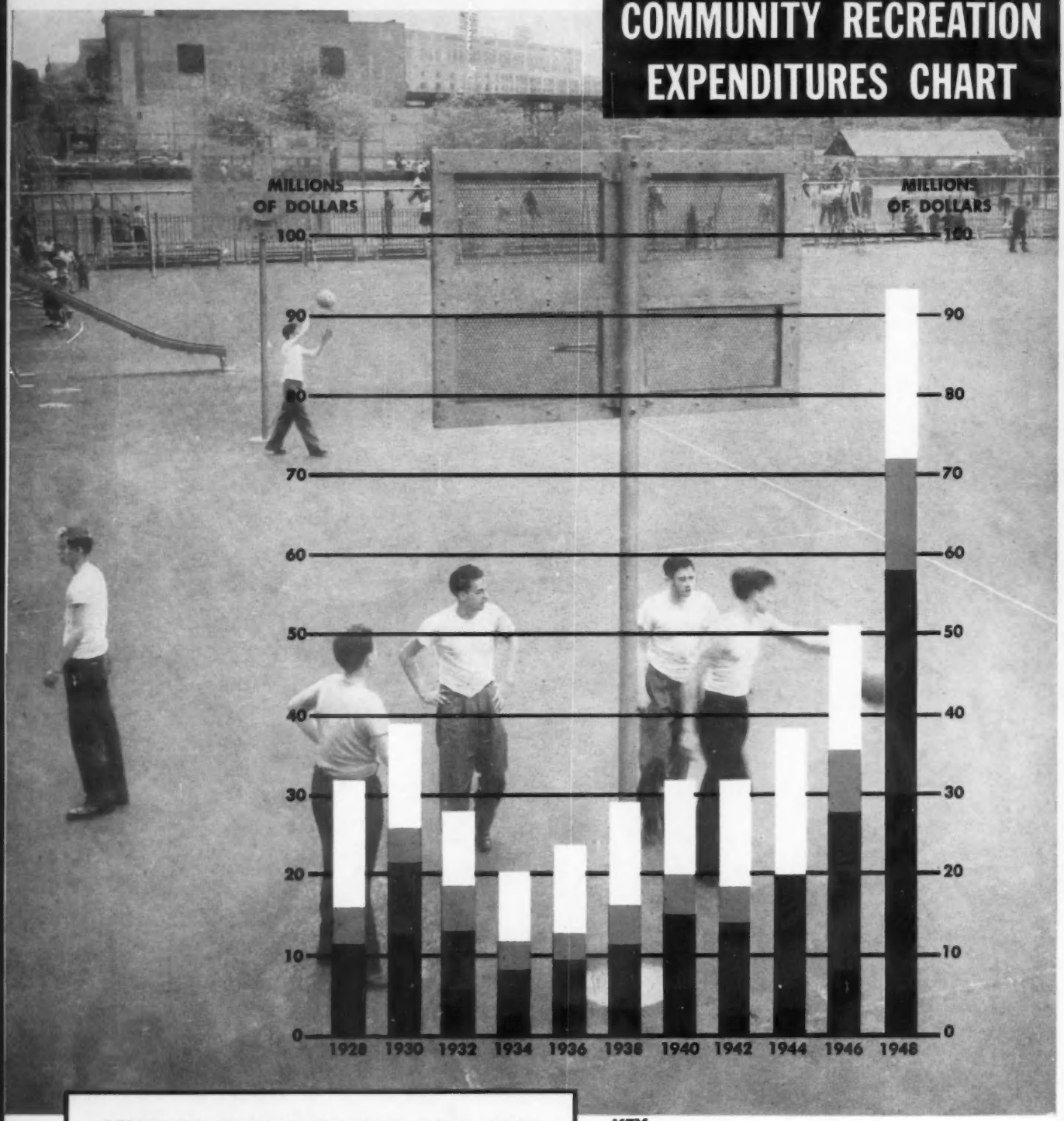
Asphalt Institute Quarterly

JULY 1960



COMMUNITY RECREATION EXPENDITURES CHART



ANNUAL EXPENDITURES FOR COMMUNITY RECREATION IN THE UNITED STATES, 1928-1948 INCLUSIVE

Courtesy of RECREATION, *published by the National Recreation Association*

KEY

- Non-Leadership Payrolls and Unclassified Expenses
- Rents, Supplies, and Incidentals
- Salaries and Wages of Leaders
- Capital Expenditures for Recreation Facilities

NOTE: In 1928 Salaries and Wages for Recreation Leadership, and in 1944 expenditures for Rent, Supplies, and Incidentals were not separately reported.

ASPHALT INSTITUTE
Quarterly

VOL. 2 NO. 3 JULY 1950

The Asphalt Institute Quarterly is published by the Asphalt Institute, a national, non-profit organization sponsored by members of the industry for the purpose of promoting interest in the use of asphaltic products.

The names of the Member Companies of the Institute, who have made possible the publication of this magazine, are listed herein on page 15.

EDITORS

Bernard E. Gray, *President of The Asphalt Institute*
Ernest M. Bristol, *Director of Public Relations*

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COVER

Featured on the double covers is a singles match on the fast asphalt playing surface of the courts of a large Western University. While the use of asphalt for this purpose is nation-wide, its all-season predominance in the West is said to account for the large proportion of western players appearing in National Tennis Championship Finals.

For the graphic chart on the opposite page, there is included, as appropriate background, the long-lasting, cork-asphalt surfaced John Mullaley Playground. Built in uptown New York City in 1932, this paving has been in constant use to date, requiring practically no maintenance or repairs.

EDITORIAL

All work and no play makes Jack a dull boy. This age-old maxim gains in force with every passing year under the conditions of our industrial civilization. Unfortunately, however, with the steady trend to city living and the consequent crowding, wholesome surroundings for play are often lacking. Not only may Jack be a dull boy because of no play, but worse, he may hunt for other outlets for his energies, which leads to trouble. There is no doubt but that juvenile delinquency is the direct result of no place to play. The American public, therefore, must answer the question, is it more economical to provide suitable play areas or can the money be spent better to provide more courts and more prisons? Somehow it would seem that this priceless new generation of America is not to be measured in dollars but rather in terms of human values.

Accompanying the trend toward city living is another phenomenon of modern times, namely, the rapidly increasing number of older people, many of whom are retired. As the pension idea gains in popularity and Social Security benefits are increased, there are certain to be many millions of people sixty years of age and over, who will be looking for suitable recreation to a degree never before known. This will take two forms as a natural course of development, one, spectator sports, and the other, the milder kinds of play suitable to these age limits.

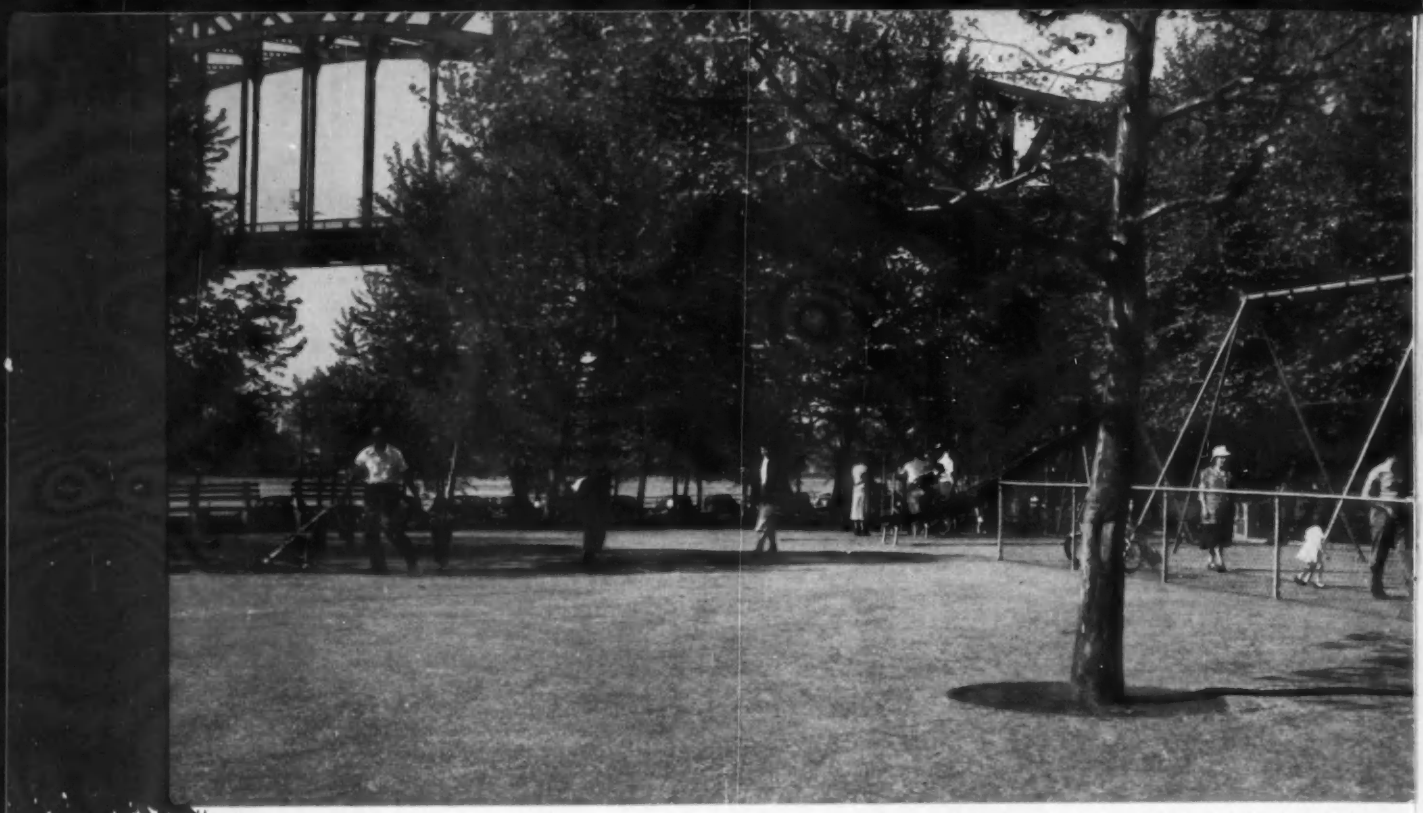
Accordingly, there are two groups of our population increasingly interested in play, and they constitute a surprisingly large per cent of the whole. Children of school age now aggregate 21%; while adults over sixty years of age total 11%. Combined, this is 32% and affords some indication of the thought to be given by city planners in order to make suitable provision for proper playgrounds, both within and adjacent to urban areas.

Community recreation expenditures, as reflected in the chart on the opposite page, increased immediately following the war and are now growing at a rapidly accelerated rate, with 1948 showing an increase of 81% over 1946. Recreation agencies reported for 1948 on a total of over 32,000 separate play areas and centers comprising 25 different types of activity, among which were approximately 13,500 outdoor playgrounds, 12,000 tennis courts, 1,500 swimming pools and 2,000 wading pools.

In addition to the organized activities of all these community-planned recreation agencies, however, there are development possibilities in even the vacant city lot. Properly arranged and fenced, if only for temporary use, it can serve a surprisingly large number of people within short walking distance of their homes. This is particularly important because it permits recreation in the half hours and single hours available for play when longer travel to the larger parks would make it impossible. To those of us who grew up next to thousands of acres of field and forest, it is a never ending revelation how much recreation is afforded by a lot sixty feet square, full of kids playing basket ball, table tennis, and various small games, and cooling off in a splash pool or just a simple shower.

This issue of the Quarterly is devoted to presentation of various types of play areas and how they can be improved with *asphalt* to provide clean, sanitary, and attractive surfaces.

and in 1944 expenditures for Rent, Supplies, and Incidentals were not separately reported.



Asphalt-paved playground at Astoria, L. I., on New York City's waterfront.

HOW TO PAVE RECREATION AREAS

The growing appreciation of the value of recreation areas and the difficulty of maintaining turf thereon, even where the conditions of play do not require a smooth, hard surface, have directed more and more attention to the design of *asphalt* surfaces for the purpose. While for general use, as in a large park, a good grassy turf is desirable, even there it often is not practicable, either because of climatic conditions or intensive use on limited areas. This is usually the case immediately adjacent to school buildings, where a suitable paving will do away with the hazards of untreated earth or loose aggregates. Commenting rather completely upon this requirement, the National Association of Public School Officials in its official booklet "Playground Surfacing," reports: "It is in-

Asphalt swimming pool at Kutztown, Pennsylvania.

dicated that the use of bituminous surfaces of one of the various types available is particularly adapted to intensively used playgrounds and to all special game courts. They can be used throughout the year in all kinds of weather and when properly laid the maintenance costs are negligible. It is indicated that wear on shoes, clothing and equipment is no greater than on natural earth, and fewer injuries resulted from its use. It would appear that if at all possible that at least a portion of the playground should be paved with this type of material."

VARIETY OF PLAY AREAS

In addition to parks and school playgrounds, however, with their tennis courts, handball courts, basketball courts, and volley ball courts, there are many new forms of recreational areas being developed for which asphalt surfaces are particularly suited. More recently there are the tracks for roller skate derby racing in addition to the larger roller skating rinks. Then there are outdoor floors for the rapidly reviving sport of square dancing, while the installation of the parking areas for drive-in theatres is almost a business in itself. Each of these areas may call for a particular type of surface, according to the needs of the recreation being enjoyed, but they all require the same fundamental attention to foundations, particularly where exposed to the weather in cold, rainy climates.

ADEQUATE DRAINAGE

First, of course, there is the item of drainage. Care should be taken to prepare the earth subgrade accurately to line and grade so that no water pockets will be formed. Sub-drainage, below the pavement proper, should be provided through the use of a porous sub-base (such as sandy gravel, stone, slag or coarse cinders), or by a system of tile or perforated corrugated pipe drains which will quickly lead water away from the foundation. For large areas, other than play courts, such underdrains are spaced usually from 15 to 30 feet apart depending upon ground-water conditions. The bottom of the drainage ditch should have a slope of not less than $\frac{1}{8}$ inch to the foot and preferably $\frac{1}{4}$ inch. It is of course important to provide adequate outlets, either to city storm sewers or open ditches, to be sure of immediate run-off.

Surface drainage is obtained best by placing the surface course on a slight slope so that the entire area is drained toward the outside edges. This is not always possible, however, either because of the size of the area or its topography, in which case catch basins should be installed at appropriate points and the surface sloped accordingly.

ASPHALT SURFACES

The wearing surface for play areas may be of a variety of asphalt types depending upon the kind of use and the quality of finish desired. Because of the lighter loads, as contrasted with areas subjected to fast moving vehicular traffic, pavement thickness often may be reduced to that required merely to waterproof the area and to provide an even surface. With natural soils which drain well, the pavement may be placed directly upon them without foundations, while in other instances where economy in first cost is a primary consideration, mixed-in-place surfaces employing sandy soils as aggregate may produce the desired result.

As in other kinds of pavement work, asphalt types lend themselves particularly well to the stage construction plan, whereby greater refinement in surface finish may be obtained as funds subsequently become available and yet all previous work is incorporated into the final structure. This is particularly important in large school playgrounds where elimination of dust and loose aggregates is an immediate need, and which often may be secured by a single surface treatment with sand cover. Later a thin plant-mix may be placed which completes the improvement so that the many play areas for ball games can then be laid out with more permanent markings. This same procedure often will prove desirable for drive-in theatres where the first need is to provide adequate drainage without wash of the cover aggregate, particularly on hillside locations.

CONSTRUCTION DETAILS

In the finishing of such areas as tennis courts, there is need for very exact construction. How this greater precision is secured is described in some detail on pages 6 and 7 following. Full details on procedures involved in the paving of *all* kinds of recreation areas are available on request to the nearest Asphalt Institute Office. An Institute Office Location Guide is shown on page 13, and complete address list on page 15.

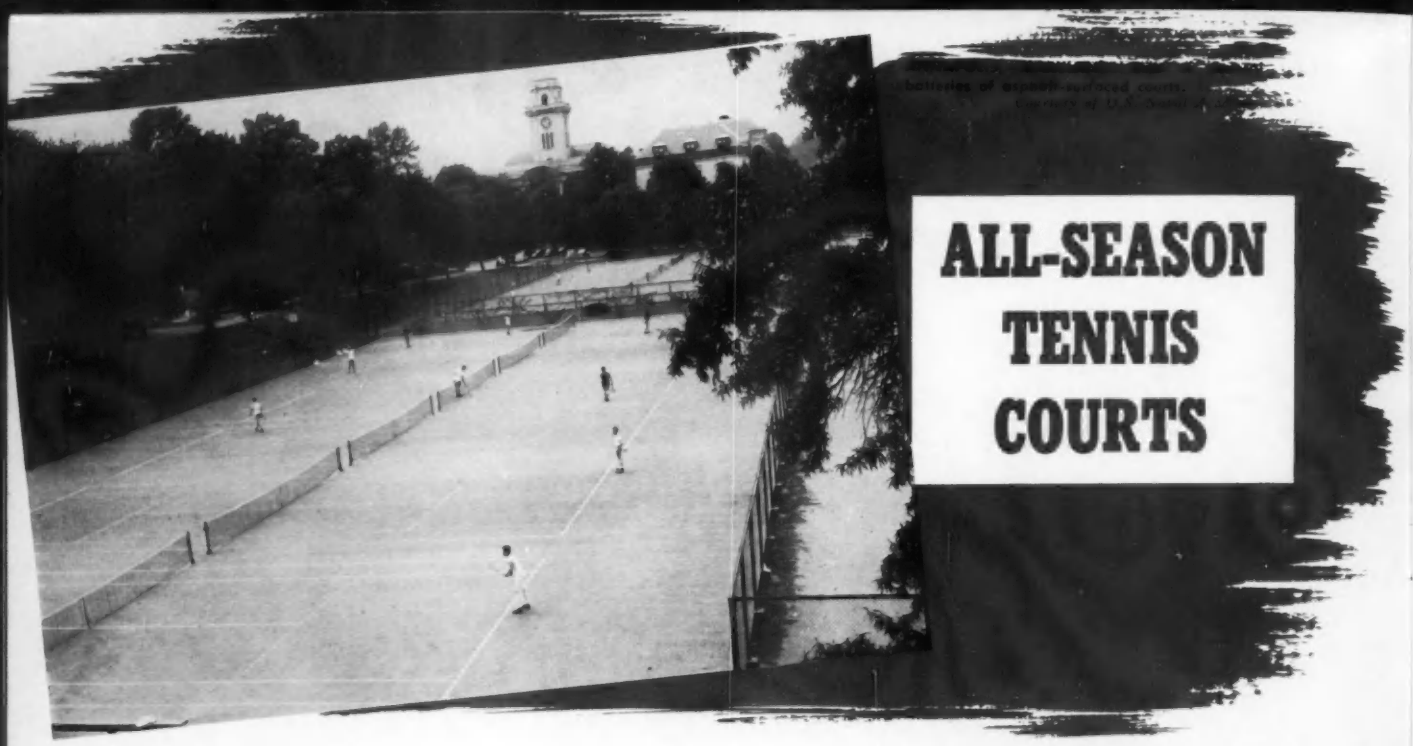
PRESENT WASTE VS CONSTRUCTIVE USE

A littered vacant lot in New York City.
Photo by Kavallines courtesy Herald Tribune

An artist's conception of how such vacant land might be put to recreational use.

batteries of asphalt-surfaced courts.

at Rutztown, Pennsylvania.



ALL-SEASON TENNIS COURTS

ADVANTAGES OF ASPHALT

Asphalt tennis courts are fast, true, available for playing immediately after a rain and are unaffected by frost. Various surface types are suitable, ranging all the way from surface treatment to hot-mix, so that a good asphalt playing surface may be obtained for a moderate expenditure where funds are limited.

The higher quality asphalt surfaces include both road-mix and plant-mix types. The latter, laid either hot or cold, permit the most accurate proportioning of the mixture.

By admixture with pigments or using colored aggregate cover, a variety of colors may be obtained, such as red, green and brown, in the event that conformity to a particular color scheme is desired. Because it is necessary to obtain a very accurate surface, asphalt tennis courts should be constructed only by experienced workmen.

DRAINAGE

Proper drainage is of the utmost importance in the construction of a good court. Where funds are limited it is much better to place a low-cost surface than to neglect the foundation. In sandy or gravelly soil, underdrainage may not be required, but in heavy clay soils it is desirable to dig a ditch entirely around the court, with such bottom slope and outlet as will prevent accumulation of water. The ditch should be 2 or 3 feet in depth, with a perforated corrugated iron pipe, or open clay tile at the bottom, and should then be backfilled with broken stone or coarse gravel to within a few inches of the surface. As the asphalt top will be impervious to water, surface drainage may be obtained by finishing to a suitable gradient.

LAYOUT

The paved area of a tennis court should be 60 by 120 feet, which gives ample room outside the limits of a doubles court, 36 feet by 78 feet for play. The plan drawing on opposite page shows the layout for a single court, which may be duplicated in any multiple desired.

It is preferable to have the entire surface in one plane but, where this is not practicable because of the topography, the slope may drop each way from the net. The usual gradient is 1 inch in 10 feet or, for a single plane, one end of the court is 1 foot lower than the other; while for a slope either way from the net, each end is 6 inches lower than center. In the construction the subgrade should be leveled and finished to such an elevation that when the base and surface course are applied later the finished surface will be slightly above the adjacent sodded area. Where fills are made, they should be compacted thoroughly, and preferably allowed to stand under the weather until subjected to several heavy rains, before placing the surface.

1. Piedmont Park, Atlanta, Georgia.

BASE COURSE

For the base course good quality steam cinders are quite satisfactory, and a compacted depth of 4 to 6 inches will be usually sufficient. Where crushed stone, slag or gravel base

courses are constructed, it is desirable to place first a layer of screenings or sand, so as to consolidate and harden the subgrade and prevent the infiltration of earth into the coarser material. A 1 inch depth of screenings well worked into the earth will be sufficient, with 3 to 6 inches compacted depth of stone, slag or gravel. The base course should be rolled thoroughly and uniformly. Base courses also may be constructed by stabilizing suitable natural soils with asphaltic products. A superior type foundation may be obtained by placing asphalt base 2 to 3 inches in compacted depth.

SURFACE COURSES

The least expensive type is a surface treatment. Care should be taken to prime the surface thoroughly, and the cover aggregate for final coat should be sand in order to achieve the desired texture. Mixed-in-place types may be used also, except that the mixing should be done in a concrete mixer or pug-mill with the same aggregates and proportions, instead of on the court surface. It is also possible to make a satisfactory mix with shovels on a mixing platform where ample labor is available. After spreading and compacting the mixture, a final seal coat with cut-back asphalt, RC-1 or quick setting emulsified asphalt RS-1 and sand cover should be made.

An asphalt macadam surface course is sometimes used but with modifications as to aggregate sizes and amount of asphalt cement. The coarse aggregate should be spread to a loose depth of 2 inches, after which it should be rolled. Hot asphalt cement should then be applied at the rate of 1 to 1¼ gallons per square yard, and lightly covered with fine aggregate. After thorough rolling the surface should be finished as described in the preceding paragraph for road-mix types. By exercising care in the application of sand cover a surface of uniform texture will be obtained.

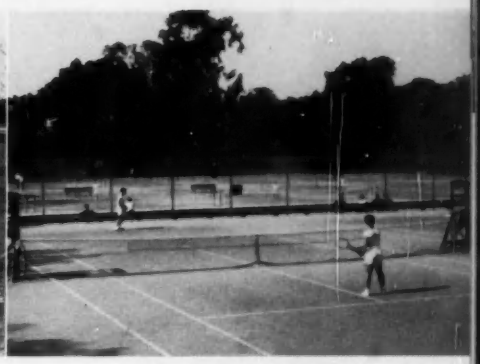
For asphalt macadam and surface treatment types the area of the court does not permit the advantageous use of the distributor spray bars, and the manually operated nozzle should be employed instead. In placing mixtures, forms should be set at not more than 10 foot intervals to form a continuous lane and the mix carefully spread and screeded to grade. As each adjacent lane is placed and consolidated the surface should be straight-edged and new material added at the joint as may be required.

The highest type surfaces are constructed with plant mixes. Coarse-graded mixtures are employed for the binder course, but the upper inch of surface course should be preferably a dense sand-asphalt mixture. Such mixtures may be accurately struck with a template to true cross section and profile, and will permit of slight adjustments to correct base irregularities. Because of the lighter traffic on a court as contrasted with a road or street, slightly more asphalt of somewhat softer consistency is recommended for the mix. Any cracking or drying out of surface with age can be remedied by light asphaltic surface treatment at the rate of 0.1 gallon per square yard of cut-back asphalt, RC-1 or quick setting emulsified asphalt RS-1 and 10 pounds of sand cover. Such retreatments should not be required more often than once in four years.

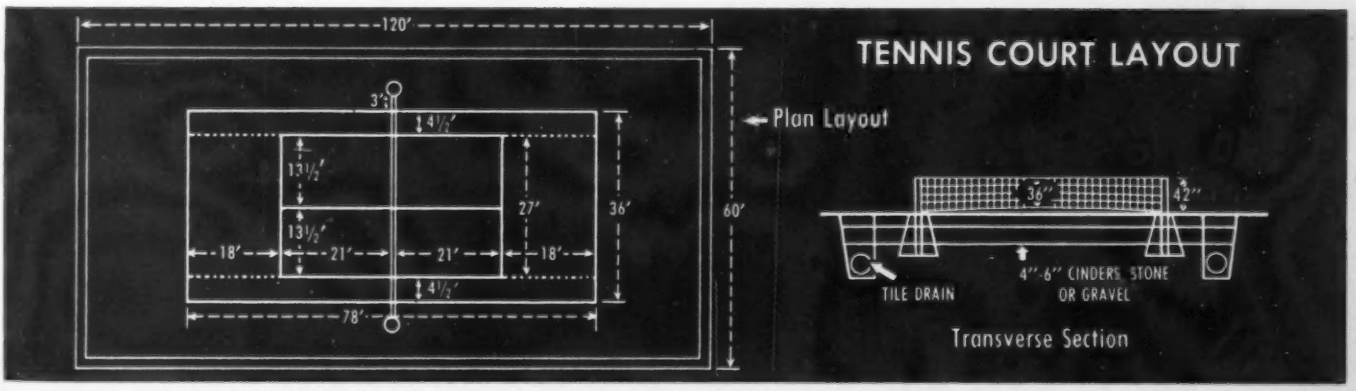
ALL-SEASON ASPHALT-SURFACED TENNIS COURTS

2. Rapid City, South Dakota.

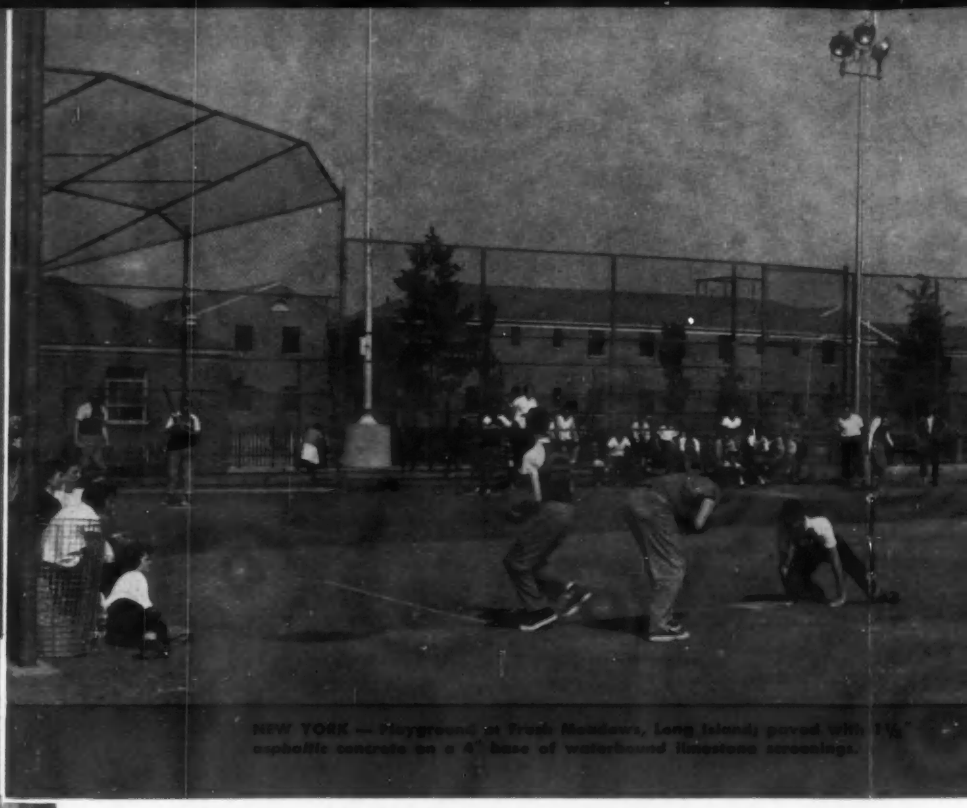
3. University of New Hampshire, Durham.



4. Golden Gate Park, San Francisco.

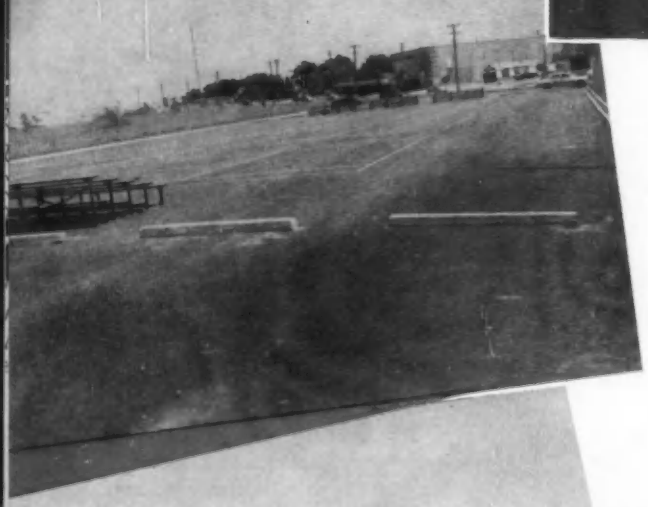


RESILIENT PAVING FOR PLAYGROUNDS



NEW YORK — Playground at Fresh Meadows, Long Island; paved with 1½" asphaltic concrete on a 4" base of waterbound limestone screenings.

TEXAS — Multi-purpose recreational area in Samuels Park, Dallas; includes areas for tennis courts, playground, soft ball, square dances and parking; surfaced with 2" asphaltic concrete.



Recreation leaders estimate that an ideal standard for playground space in the United States is one acre of play area for each one thousand population. This means upward of one hundred and fifty thousand acres. Pavement for this area, if expressed in *road-building* terms, would approximate forty-five thousand miles, thirty feet wide.

PLAYGROUND SURFACING

Pavement is, of course, not the immediate requirement for all playgrounds. Where it is, however, the following outline guide may help to shape the planning of those who are responsible for such improvement.

Asphalt surface treatment, penetration macadam, hot and cold-laid mix surfacings have been used for playgrounds and, except for such modification as may be necessary because of restrictions due to area, the same procedure should be followed as when building a highway. For most situations a foundation thickness of from 2 to 6 inches will be ample. Cinders,

OKLAHOMA — Whittier Elementary School Playground in Tulsa. In 1949, the gravelled surface with limestone chats was paved with 2" asphaltic concrete.

OHIO — A miniature golf course at the Airport Playground, Cincinnati; surfaced with 1½" asphaltic concrete.

crushed stone and gravel all make excellent bases and drain readily because of their porous nature. Foundations also may be constructed by stabilizing suitable natural soils with asphaltic products. Except for surface treatment, a surface course thickness of from 1½ to 2 inches is desirable, from the standpoint of durability. The surface texture as a rule should be fine grained, and this is best obtained by application of a thin seal coat of cut-back asphalt, RC-1 or MC-3 covered with fine aggregate, or a thin grout of slow setting emulsified asphalt SS-1 and sand. In addition to those types which use the usual mineral aggregates, experiments have been made with sawdust or cork fillers with a view to producing a smoother surface. These types have been successfully used in a number of large cities, and are particularly satisfactory for school yard surfacing.

For an asphalt-sawdust surface the procedure is essentially similar to surface treatment, and may be an original treatment over a waterbound surface course or a retreatment over an established surface. It may be either a light or heavy treatment. In the former all the sawdust should pass a No. 4 sieve, and for the latter a ½ inch sieve. In the light treatment the usual procedure described for Specification S-2 or S-1 should be followed, except that sawdust is substituted for the mineral aggregate. The surface should be thoroughly rolled with a light roller until the sawdust is well embedded. Emulsified asphalt may be also used as a binder. For the heavy treatment either heavy rapid curing cut-back asphalt, RC-4 or a hot asphalt cement may be used. The asphalt cement should have a penetration between 150 and 300, and be applied at a temperature between 275° F. and 325° F.

After application of the asphaltic material coarse sawdust should be spread and rolled until thoroughly embedded. The amount of asphalt should be about three-tenths gallon per square yard, with the sawdust added in thin applications and broomed about until no more will adhere.

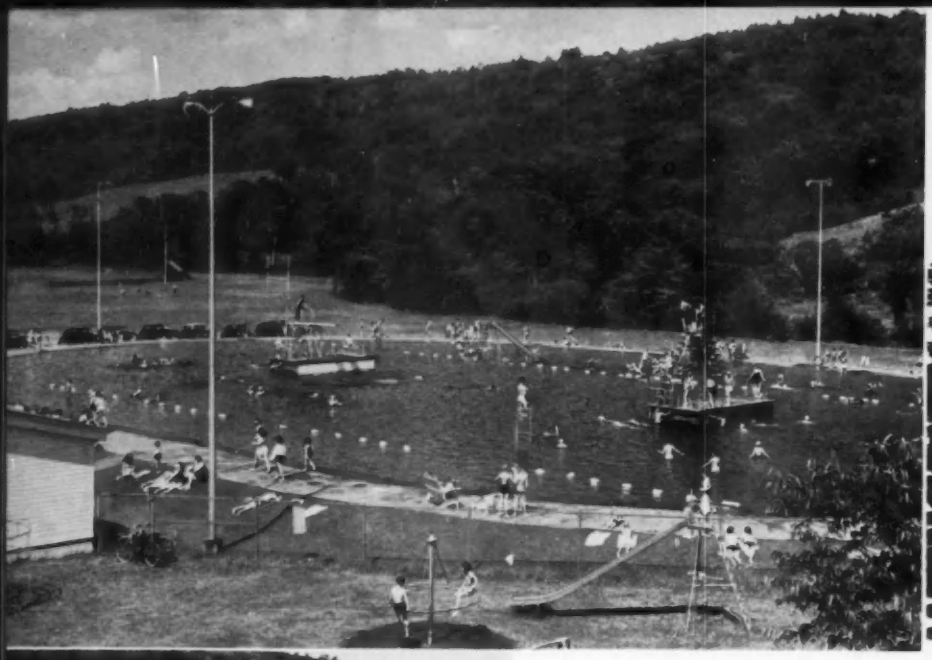
For an asphalt cork surface the course is laid to a compacted depth of 1 to 2 inches, and usually upon a plant-mix base or binder course. The mix should be composed of granulated cork, ¼ inch maximum diameter, sharp coarse sand, limestone dust and an asphalt cement of 50-60 penetration. The following weight proportions have been used successfully in surfacing an exceptionally large municipal playground:

	Per Cent
Clean sharp sand	70 to 72
Ground cork	5 to 6
Limestone dust	7 to 8
Asphalt cement	15 to 17

PAVING DETAILS

Full details on procedures involved in the paving of playgrounds, with the various asphalt types mentioned, are available upon request to the nearest Asphalt Institute Office. Select the address by consulting the Institute Office Location Guide on page 13.

COLORADO — Playground at Moore School, Denver; surfaced with 1½" asphaltic concrete on 1½" pea gravel base.



MONTPELIER, VERMONT—The largest Asphalt-Surfaced Swimming Pool.

ASPHALT SWIMMING POOLS

Construction Photo. General view of pool, with forms and ramp leading to pool at right.

Cross-section, with mono-filled sheet asphalt side gently sloping "beach."

GENERAL CONSIDERATIONS

Recreation Agencies in the United States reported as under their supervision in 1948 fifteen hundred swimming pools. To this total there should be added a large and rapidly increasing number in private ownership and use. These pools have various types of paved surfaces, but *asphalt* because of its superior waterproof characteristics is particularly well adapted for such use. Best asphalt construction calls for a dense graded hot-laid surface course, although well sealed asphalt macadam has also been successfully used. It is important that the surface course be laid on a substantial well-drained base so as to eliminate any back pressure from ground water when the pool is periodically emptied for cleaning. In cold climates, depending upon the thickness of ice formation, the pool may be drained to any desired level to produce a skating rink.

ASPHALT POOL AT MONTPELIER

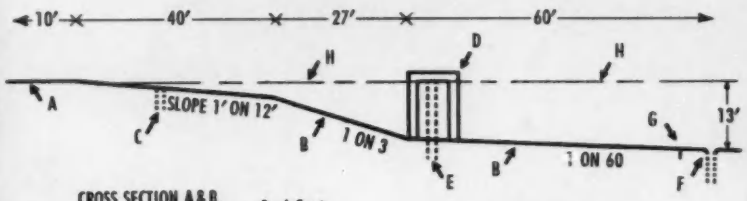
Montpelier, Vermont, as part of a public recreation park, completed in 1939 an asphalt swimming pool of record size, having a water surface area of forty thousand square feet and water depths varying from zero to twelve feet. Areas are thus provided where younger bathers can be accommodated and a central area where the more expert may swim. There are two diving platforms provided in the deeper area. The pool was excavated and formed in a gravelly-clay soil, stabilized with asphalt, followed by a 2½″ base course of asphaltic concrete and surfaced with ¾″ stone-filled sheet asphalt mixture. This surface was swept with limestone dust and then sealed with hot 85-100 penetration asphalt, 0.1 gallon per square yard and sanded. The pool is bordered by a ten foot wide sidewalk similarly constructed and treated.

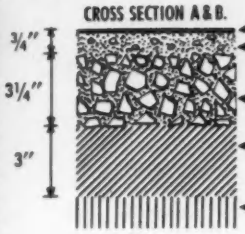
The pool is oval in shape with easy curves and pleasing contour, the light color so blended that it eliminates glare, yet provides a clear vision bottom. Its water capacity is one million gallons and the load to be carried by the foundation well over four thousand tons. A longitudinal cross-section is shown at the top of opposite page.

VERSATILITY IN USE

Asphalt-paved pools can provide large swimming areas at comparatively low cost. Details of the versatile use of the Montpelier pool are as follows: On one side the life line is placed along the intake pipe the complete length of the pool for small children and for wading purposes, which gives a water depth not in excess of 15 inches. On the opposite side the line is placed at a three foot depth completely along the entire side for children learning to swim. This allows the entire center for people who swim, having no steeper than an eight foot

LONGITUDINAL CROSS SECTION OF MONTPELIER POOL





A&B Sidewalk And Pool Lining Of Continuous Asphalt Concrete
C—Water Inlet (8)
D—Diving Platform (2)
E—Overflow Pipe (2)
F—Drain (Clean Out)
G—Back Pressure Relief Valve (7)
H—Pool Surface

drop in twenty-four feet, as shown on the cross-section. This pool is adaptable to any desired swimming conditions, varying with the spacing of the diving platforms. It is also possible to construct runways leading to them.

ASPHALT ADVANTAGES

Superior qualities of asphalt-paved swimming pools include smoothness, pleasing appearance, and exceptionally good weathering qualities. These latter are based upon asphalt's resistance to water, sun-light, air, pressure, weight, freezing, thawing, chlorine and abrasion.

RESURFACED SWIMMING POOL

Another very large swimming pool, now asphalt-surfaced, is located at Crescent Hill, Louisville, Kentucky. This pool, 175 feet long by 150 feet wide, oval in shape, originally of rigid-type surface construction, had cracked and disintegrated so badly that in 1948 it was decided to resurface with asphalt. Construction procedure consisted of patching, priming with a tack coat of a rapid-setting liquid asphalt, and resurfacing with one and one-half inches of hot-mix asphaltic concrete. After the bottom of the pool had been paved, using standard paving equipment and a 10-ton roller, the surface was coated lightly with aluminum paint, and two coats of white marine then applied.

Resurfaced pool at Crescent Hill, Louisville, Kentucky.

The same pool in use. ➡

ASPHALT WADING POOLS

An asphalt wading pool may be visualized as a huge shallow platter, with a gradual slope to a suitable depth, possibly about eighteen inches, —and a waterproof surface. For this surface, three inches of hot-mix sheet asphalt or a fine-graded asphaltic-concrete, properly placed and compacted, on a well-drained foundation, will provide the necessary waterproofness and adequately smooth texture.

It is important that the foundation for the pool be carefully constructed by first shaping the earth subgrade to proper conformation and then densifying by thorough compaction at least eight or nine inches of the subgrade material. As there should be provision for draining, the bottom of the pool should be sloped slightly so that it may be quickly cleaned. Any good asphalt paving contractor can construct an asphalt wading pool, as in reality it is merely a paving job transferred to a small area, and with shallow slopes to be compacted, instead of all on a horizontal plane surface.

An asphalt wading pool, as the surface is not affected by freezing, will serve equally well for a skating rink in winter.

REPAVING WITH ASPHALT

The resurfacing of the large Crescent Hill swimming pool was so successful that it was decided in 1949 to repave the cracked and disintegrating surface of the nearby wading pool. This was effectively salvaged by placing, over its approximately 2,000 square feet of worn out rigid-type paving, after patching and priming, a smooth, waterproof surface of one and one-half inches of sheet asphalt. The resurfaced pool is shown below.

Burbank, California. San Val Drive-in, constructed in 1936, is the oldest in Southern California; paved early this year with asphalt penetration macadam.

Open-air, drive-in movie theatres are no longer a fad. With eighteen hundred already in operation and the prospect of boosting this total to two thousand in the United States during the present summer, their installation is becoming almost a business in itself. A single drive-in chain, with headquarters in Atlanta, now owns fourteen such theatres located in Florida, Georgia, North Carolina and South Carolina.

Asphalt pavement, ranging from surface treatments to the higher types, is being largely used, both in improving old installations and in new 1950 construction. A notable new "outdoor movie palace" is the Bankhead Drive-in Theatre, opening in Georgia, five miles west of Atlanta, adjacent to U.S. Route 78. Built on a twenty-five acre tract, beautifully landscaped in a natural setting of pine trees, its scientifically terraced and paved parking ramps total fifty thousand square yards, and the car capacity is eight hundred. The screen, 74′ x 60′, is said to be the largest in the South. The pavement on a crushed stone base is an asphalt surface treatment. In addition to the finest and most up-to-date projection equipment, the theatre will be provided with improved type individual car speakers and heaters. Innovations include a 100-foot concession bar, rest rooms, public telephones, car service, a play area for children, and complete tire and battery service.

This Georgia installation, so effectively planned, is in keeping with the versatile developing of such outdoor arenas throughout the United States. Starting from primitive beginnings, they now offer all kinds of extra attractions to bring the family out in the evening. For the children there are such things as pony rides, playgrounds and miniature zoos; for their elders, dance floors, bowling alleys, deck-tennis courts, boxing matches and beauty contests. These diversions are intended to keep the patrons contented until dark. Science has helped to bring the comforts of the regular movie house. Most arenas have individual speakers for each car. Rain is no longer a hindrance, for means have been found to prevent the water from forming drops on the windshield.

PAVING PROCEDURE

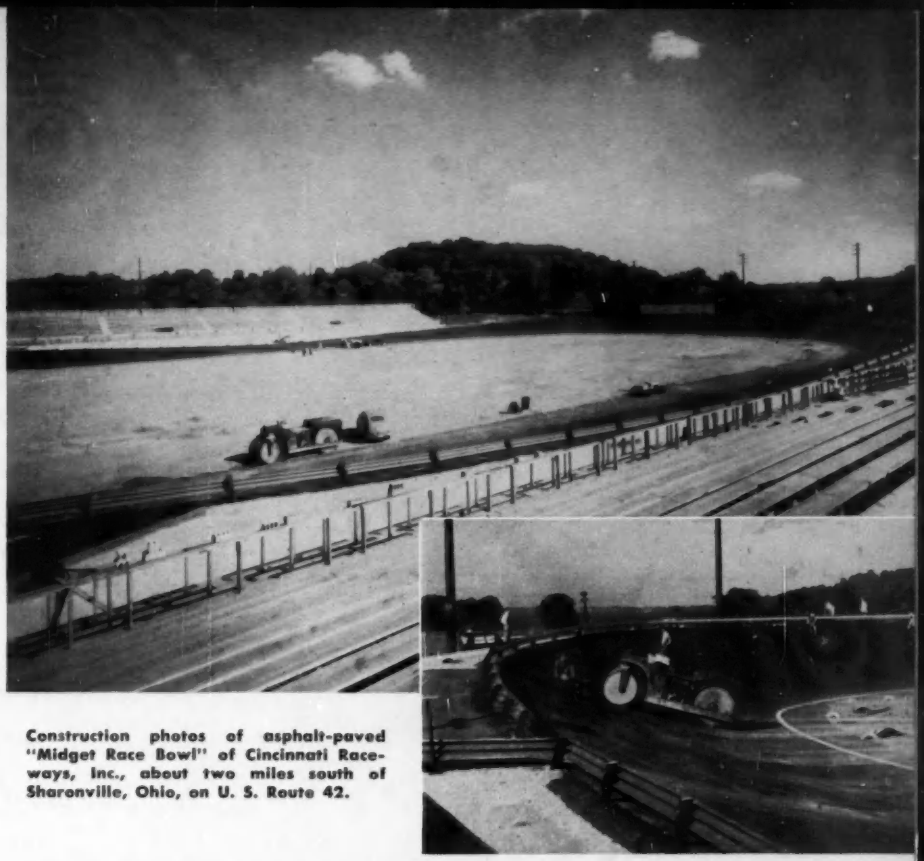
Details on how to obtain and maintain the necesary stable, waterproof surface required for drive-in theatres are available upon request to the nearest Institute Office. Select the address by consulting the map on opposite page.

Totowa, New Jersey. Drive-in, near Paterson, paved with an asphalt mixed-in-place type.

Dallas, Texas. Drive-in, asphalt surface treated.

PAVING A MIDGET RACE TRACK WITH ASPHALT

Upon this midget race track, near Sharonville, Ohio, fourteen miles northeast of Cincinnati, the pavement, laid in 1948, consists of 2″ of hot-mix *asphaltic* concrete, upon a 4″ cold-mix bituminous base, over a sandy loam soil. The width of the track is forty feet on straightaways and forty-five feet on the curves. In size, the long axis length of the bowl is five hundred and eighty-five feet and the short axis three hundred and twenty-five feet. This may be visualized as about twice as long and twice as wide as a football playing field. For such high-speed tracks, expert paving technique is required, particularly at the turns, where the gradually changing slope involves varying super-elevations for the different degrees of curvature.

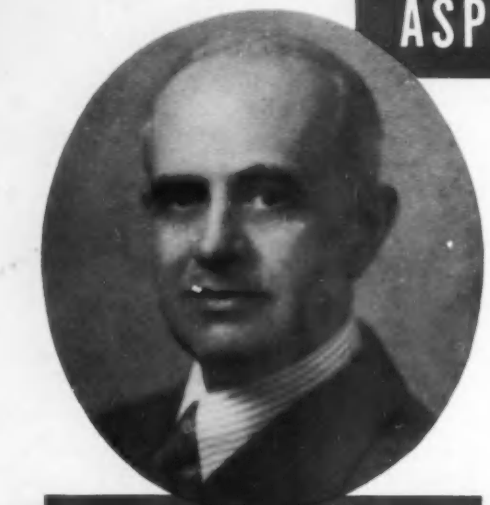


Construction photos of asphalt-paved "Midget Race Bowl" of Cincinnati Raceways, Inc., about two miles south of Sharonville, Ohio, on U. S. Route 42.

GEOGRAPHICAL GUIDE FOR ENGINEERING INQUIRIES FROM READERS

For full details on procedures involved in the asphalt paving of all kinds of recreational areas, write to nearest Asphalt Institute Office. Local headquarters cities are shown on the accompanying map, and full addresses listed at the bottom of page 15.

ASPHALT INSTITUTE ENGINEERS



HERBERT SPENCER

District Engineer At New York

Herbert Spencer, from his headquarters in the New York office at 801 Second Avenue, directs the local engineering activities of The Asphalt Institute throughout the states of New York and New Jersey.

Joining the staff in 1941, Mr. Spencer now serves both as District Engineer and as Secretary of the Institute. Since his graduation as a Civil Engineer from Rensselaer Polytechnic Institute at Troy, New York, he has been affiliated for over forty years with highway development work in the United States in various capacities. His start was with the New York State Highway Department, followed by many years of service as Technical Consultant for one of the asphalt producing companies. This work enabled him to participate in actual road construction in many parts of the country and to develop asphalt grades suited to specific conditions.

Mr. Spencer served as Commanding Officer of Company H, 23rd U. S. Engineers, the Road Building unit of the American Expeditionary Forces in the First World War, and is a member of many technical societies active in highway studies. These include the American Society for Testing Materials, the Association of Asphalt Paving Technologists, the Municipal Engineers of the City of New York, and the Engineers' Club of New York City.

HUGH A. WALLACE

Division Engineer At Dallas

From Division Headquarters in the Southwestern Life Building in Dallas, Hugh A. Wallace directs the Institute engineering and promotional activities in Texas, Oklahoma and New Mexico.

Mr. Wallace, fourth in years of service on the Institute divisional engineering staff, served seventeen years with the Texas Highway Department, his last position being that of Field Maintenance Engineer. Other experience in engineering work includes one year as superintendent for a general contractor on highway and railroad construction and, just prior to coming with the Institute, one year of service with the U. S. Engineers at San Antonio and Dallas. As Field Maintenance Engineer of the Texas Highway Department, Mr. Wallace was successful in effecting uniform highway maintenance methods and standardizing many maintenance practices throughout the State.

Mr. Wallace is a member of the Highway Research Board (Associate), the American Road Builders' Association, the Association of Asphalt Paving Technologists, the National Society of Professional Engineers, the Society of American Military Engineers, and the Engineer Clubs of Dallas and Austin.

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801 SECOND AVENUE • NEW YORK 17, N. Y.

Printed in U.S.A.

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